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Developing Rock Physics Algorithms for Velocity-Porosity Relations with Environmental Geophysics Applications

For underground imaging using seismic or electrical methods, observed elastic wave traveltimes or output voltage/input current ratios are inverted to estimate geophysical properties such as wave velocity or electrical conductivity. We are using effective medium theories to develop algorithms relating elastic wave velocities to porosities and conductivities to fluid saturation, for joint inversion of our geophysical measurements to obtain direct estimates of the hydrogeologic parameters that control contaminant distribution and movement.

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